

REMARKS

Claims 4-20 are pending in the application. Claims 14 and 15 are hereby withdrawn from consideration and Applicants reserve the right to file one or more divisional applications taking up these claims.

Election

Applicants hereby affirm the election without traverse of Claims 4-13 and 16-20.

Double Patenting

The Examiner provisionally rejected Claims 16-20 under the judicially created doctrine of obviousness-type double patenting in view of copending U.S. Patent Application Serial No. 11/039,040, filed January 20, 2005. Applicants acknowledge the provisional double patenting rejection. In the event U.S. Patent Application Serial No. 11/039,040, filed January 20, 2005, issues as a patent, Applicants will respond accordingly in the present application.

Claim Rejections – 35 U.S.C. § 102

The Examiner rejected Claims 4-6, 8-13, and 16-20 under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent Application Publication No. 2002/0183608 to Marmulla et al. (hereinafter "Marmulla et al. '608").

Marmulla et al. '608 discloses optical referencing system 1, shown in Fig. 1, including position detection unit 4 and optical 3-D scanner 5. Position detection unit 4 may acquire coordinates of each 3-D marker 6. Scanner 5 may detect the shape and color of surfaces on geometric device 7 but cannot detect markers 6. Geometric device 7 may be a base on which a 3-D marker 6 is positioned, or, alternatively, geometric device 7 may be formed by a plurality of 3-D markers 6. Geometric device 7 may be constructed in various forms, such as devices 7', 7'', and 7''', shown in Fig. 5, which each include at least one 3-D marker 6. In one embodiment, geometric device 7 including at least one 3-D marker 6 may be positioned on frame 14, shown in

Fig. 3. In this form, the coordinates of 3-D markers 6 may be determined by scanning device 7 with scanner 5 and using processing unit 2 to calculate the coordinates based on a known relationship between device 7 and each marker 6.

Nowhere does Marmulla et al. '608 disclose or suggest the following:

- a set of tracking arrays including a first array body having a first array of tracking elements in a predetermined spatial configuration and a second array body having a second array of tracking elements in a predetermined spatial configuration distinct from the predetermined spatial configuration of the first array of tracking elements, as called for in amended independent Claim 4;
- a multiple configuration tracking array including an array body and a predetermined number of tracking elements positionable in alternate configurations to produce alternate patterns, as called for in independent Claim 6;
- a surgical navigation system including means for tracking an object by detecting the positions of a predetermined number of tracking elements, and an array body having a predetermined number of tracking element attachment locations, the tracking elements being positionable in alternate configurations of attachment locations, as called for in amended independent Claim 13; and
- a surgical navigation system including an array and a plurality of tracking elements, the position of at least one tracking element being adjustable to produce alternate spatial arrays of tracking elements, as called for in independent Claim 16.

In contrast, Marmulla et al. '608 discloses frame 14 having a plurality of 3-D markers 6 positioned thereon. Markers 6 are positioned on frame 14 either indirectly, e.g., positioned on geometric devices 7 which are positioned on frame 14, or directly. Marmulla et al. '608 fails to disclose or suggest a second array body having a second array of tracking elements in a predetermined spatial configuration distinct from the predetermined spatial configuration of the first array of tracking elements, as called for in amended independent Claim 4, e.g., nowhere does Marmulla et al. '608 disclose a second frame 14 on which markers 6 are positioned in a pattern or configuration different from the configuration shown in Fig. 3. Furthermore, Marmulla et al. '608 fails to disclose or suggest markers 6 being positioned in different configurations on each geometric device 7. The Examiner states that Marmulla et al. '608 discloses that the spatial characteristics of each geometric device 7 may be used to uniquely identify the device, such as devices 7', 7'', and 7''' (Fig. 5); however, Marmulla et al. '608 never discloses or suggests altering the position of markers 6 to provide unique spatial characteristics of the tracked elements. Instead, the geometric relationship of markers 6 on devices 7', 7'', and 7''' remains constant in Fig. 5. Nowhere does Marmulla et al. '608 suggest providing a different location or configuration of marker 6 with respect to each device 7', 7'', or 7'''.

Marmulla et al. '608 provides no disclosure of positioning or adjusting the tracking elements in alternate configurations or spatial arrays to produce alternate patterns, as called for in independent Claims 6, 13, and 16, e.g., markers 6 are positioned on frame 14, as shown in Fig. 3, and nothing in Marmulla et al. '608 indicates that markers 6 are positionable anywhere other than the locations shown in Fig. 3. The Examiner indicates that frame 14 includes a plurality of tracking attachment locations which outnumber markers 6. Further, the Examiner points to Figs. 3 and 6 of Marmulla et al. '608 and indicates that the array body may include cylindrical recesses at attachment locations which are engageable with cylindrical members of the tracking elements. While frame 14 includes a plurality of circles adjacent each marker 6, as shown in Fig. 3, nowhere does Marmulla et al. '608 disclose or suggest what the circles adjacent to each marker 6 may be used for. The specification of Marmulla et al. '608 is silent regarding any description of these attributes of frame 14. Further, as shown in Fig. 6, the

cylindrical structures referred to by the Examiner are not recesses, but instead the specification of Marmulla et al. '608 sets forth that element 16 is an LED 3-D marker and element 17 is a passive reflector (see paragraph [0033]), with no discussion of any cylindrical recesses.

Because Marmulla et al. '608 does not disclose or suggest a set of tracking arrays including a first array body having a first array of tracking elements in a predetermined spatial configuration and a second array body having a second array of tracking elements in a predetermined spatial configuration distinct from the predetermined spatial configuration of the first array of tracking elements, as called for in amended independent Claim 4; a multiple configuration tracking array including an array body and a predetermined number of tracking elements positionable in alternate configurations to produce alternate patterns, as called for in independent Claim 6; a surgical navigation system including means for tracking an object by detecting the positions of a predetermined number of tracking elements, and an array body having a predetermined number of tracking element attachment locations, the tracking elements being positionable in alternate configurations of attachment locations, as called for in independent Claim 13; and a surgical navigation system including an array and a plurality of tracking elements, the position of at least one tracking element being adjustable to produce alternate spatial arrays of tracking elements, as called for in independent Claim 16, Applicants respectfully submit that Claims 4, 6, 13, and 16, and Claims 5, 8-12, and 17-20, are patentable over Marmulla et al. '608.

Claim Rejections – 35 U.S.C. § 103

The Examiner rejected Claim 7 under 35 U.S.C. § 103(a) as being unpatentable over Marmulla et al. '608. Applicants respectfully submit that Claim 7 is patentable for at least the reasons advanced above with respect to Claim 6, from which Claim 7 depends.

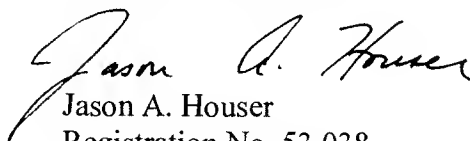
It is believed that the above represents a complete response to the Office Action and reconsideration is requested. Specifically, Applicants respectfully submit that the current application is in condition for allowance and such action is earnestly solicited.

Application No. 10/649,749
Amendment dated January 9, 2007
Reply to Office Action of October 13, 2006

In the event Applicants have overlooked the need for an extension of time or payment of fee, Applicants hereby petition therefor and authorize that any charges be made to Deposit Account No. 02-0385, BAKER & DANIELS.

If any questions concerning this application should arise, the Examiner is encouraged to telephone the undersigned at 260/424-8000.

Respectfully submitted,



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NAME OF REGISTERED REPRESENTATIVE


SIGNATURE

January 9, 2007